

REMARKS

I. Introduction

In response to the final Office Action dated January 12, 2009, Applicants have amended claims 1, 20 and 22 in order to further clarify the present disclosure. Claims 2, 21 and 23 have been cancelled, without prejudice. No new matter has been added.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. The Rejection Of Claims 1-3 And 19-24 Under 35 U.S.C. § 102/103

Claims 1-3 and 19-24 were rejected under 35 U.S.C. § 102(e) as being anticipated by or, alternatively, under 35 U.S.C. § 103(a) as being unpatentable over Ishihara et al. (Journal of Photopolymer Science and Technology, Vol. 15, No. 5, (2002), p. 769-774); and claims 1-3 and 19-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Higashi (EP 1063869) in view of Turner et al. (USP No. 4,764,625). Applicants respectfully traverse these rejections of the pending claims for at least the following reasons.

With regard to the present disclosure, amended independent claims 1, 20 and 22 each recite an organic electroluminescent device comprising an organic compound layer including at least one hole transport film containing NPB (N,N'-di(naphthalene-1-yl)-N,N'-diphenyl-benzidine), wherein said organic compound layer contains copper atoms as impurities in a weight concentration of from 40 to 200 ppm.

One feature of claims 1, 20 and 22 is that the compound N,N'-di(naphthalene-1-yl)-N,N'-diphenyl-benzidine (NPB) is used in the hole transport film.

In contrast, none of the cited prior art references disclose NPB. For this reason alone, amended independent claims 1, 20 and 22 are not anticipated by the cited prior art.

Furthermore, the Examiner alleged that it would have been obvious to one of ordinary skill in the art to have purified the compounds because it would be expected that a purified compound would perform better than an unpurified compound. However, the prior art does not suggest the claimed range of claims 1, 20 and 22 (40-200 ppm Cu) nor does the prior art even disclose that copper impurity level is an important characteristic with regard to luminance efficiency and lifetime. While the Examiner can recite that it is obvious to purify a compound, there is no suggestion to purify the compound with regard to copper. Moreover, the specification does disclose that the compounds are purified by sublimation, which is different than that of the prior art (column chromatography). Thus, the Applicants have shown that the concentration of copper is not inherent in the cited prior art. As such, the cited prior art are non-enabling references.

Moreover, the features of the present disclosure recited in claims 1, 20, and 22 provide **unexpected superior results** in relation to improved luminous efficiency and luminescent lifetime. Only Applicant has recognized and considered the parameter (e.g., the amount of Cu of not lower than 40 ppm and not higher than 200 ppm) in relation to luminous efficiency and luminescent lifetime to achieve the disclosed results described in the present specification. As can be seen in Table 1 on page 31 of the present specification, the EL devices that have from 40 to 200 ppm of copper exhibit unexpected and superior results over those with copper concentrations higher than 200 ppm. The unexpected jump in both luminous efficiency and luminescence lifetime when going from 500 ppm to 200 ppm cannot be predicted by the prior art. Ishihara et al., Higashi, and Turner et al. are completely silent as to the improvement in

luminous efficiency and luminescent lifetime achieved by the present invention, and does not enable optimization of the claimed parameter.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Moreover, in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. Because Ishihara et al. do not disclose the organic compound layer contains copper atoms as impurities in a weight concentration of not lower than 40 ppm and not higher than 200 ppm, as required by claims 1 and 20; and the copper atoms can be detected, and are present in a weight concentration of not higher than 200 ppm, as require by claim 22, Ishihara et al. do not anticipate, or render obvious, claims 1, 20, and 22.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 1, 20 and 22 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also

in condition for allowance. As such, Applicant respectfully submits that the new claims 6-11 are allowable over the cited prior art.

IV. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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